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Model of water influx to a perfect well with allowance for the water loss by the overlying clay layer

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Abstract

Consideration is given to a mathematical model of water influx to a perfect well drilling in a homogeneous water-bearing stratum. The novelty of the problem is in the method of allowing for the additional water influx from the overlying swelling clay layer to the stratum. The model of water loss by a swelling clay layer, proposed by the authors earlier, is used for calculation of the water influx. This model is based on the generalization of filtration-consolidation theory to the case where the mass of the solid phase of a porous skeleton changes due to the fluid crossflow during the processes of swelling and shrinkage under the action of osmotic pressure.

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